Update on Broadband Irradiance VAPs

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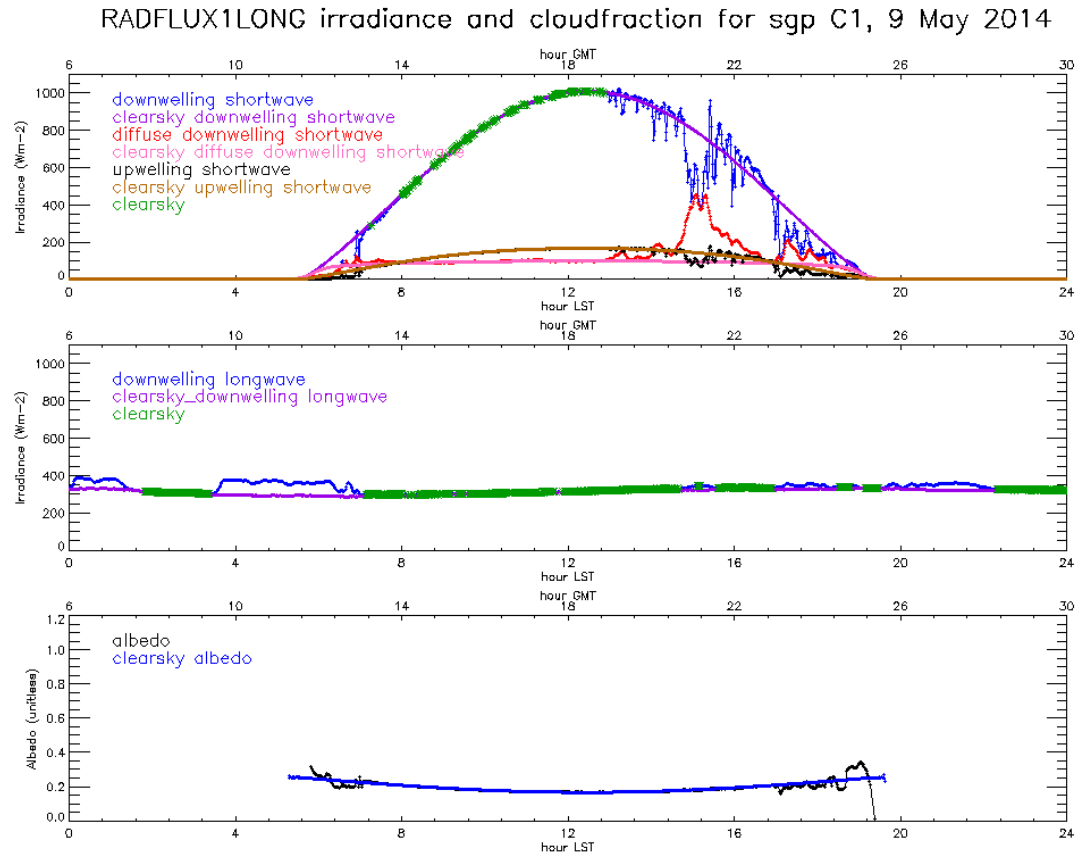Yan Shi

Recent Broadband VAP updates:

- Created scripts to simplify and make the annual processing of QCRAD c2 level data more robust
  - In addition to automated quality checks QCRAD applies IR loss correction to PSP global measurements.
  - c2 level applies instrument specific IR loss correction based on the serial number in the SIRS/SKYRAD files which is automatically
  - Thanks to Annette, Yan, instrument mentors for testing and updating procedure to

Recent Broadband VAP updates:

- Implemented Chuck Long's Radiative Flux Analysis as an operational VAP
  - Data processed at all sites including extended facilities and archived

RADFLUX1LONG irradiance and cloudfraction for sgp C1, 9 May 2014

downwelling shortwave
clearsky downwelling shortwave
diffuse downwelling shortwave
clearsky diffuse downwelling shortwave
upwelling shortwave
clearsky upwelling shortwave
clearsky

downwelling longwave
clearsky_downwelling longwave
clearsky

albedo
clearsky albedo

Current and Future Broadband VAP efforts:

- Updating Surface Cloud Grid for new radiative flux analysis variables and extended facility site arrangement
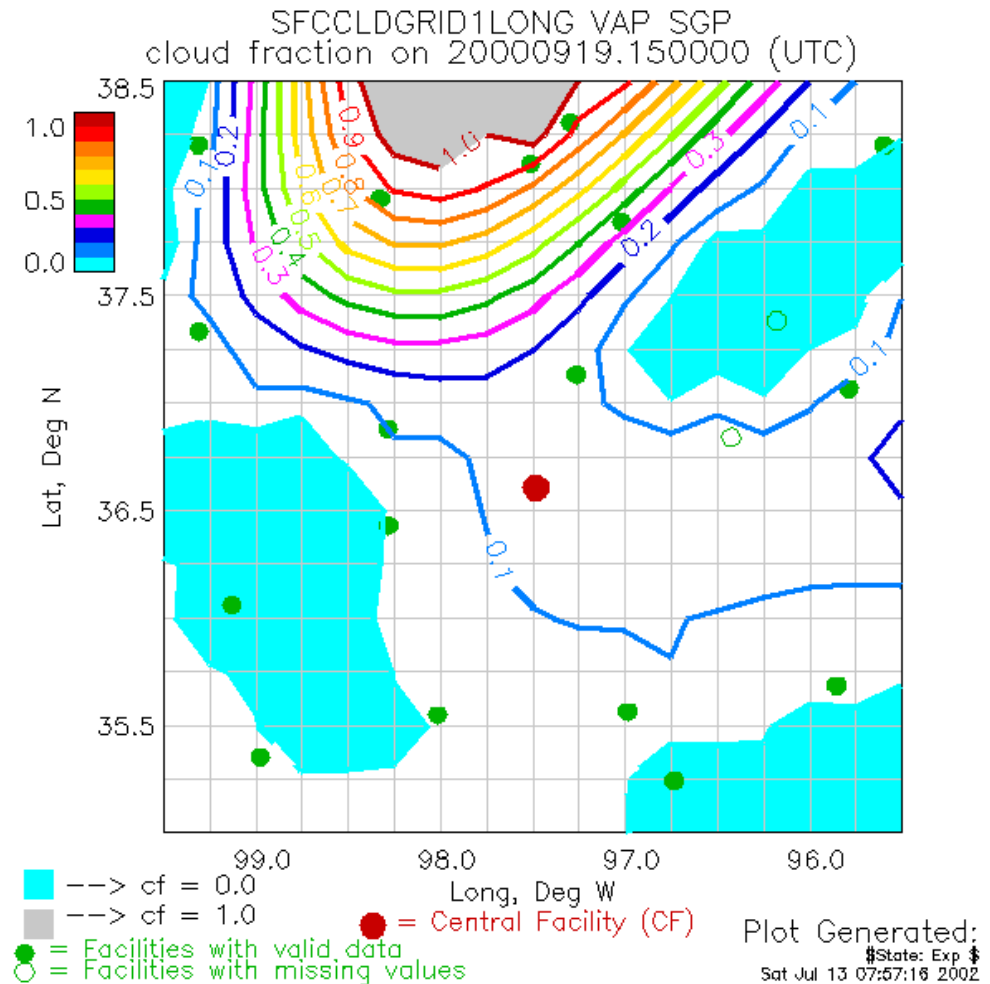
Current and Future Broadband VAP efforts:

- Need to calculate broadband from MFRSR spectral irradiance measurements for upcoming replacement of open channel with 1625 nm channel

Table 3
The ten best fits in terms of lowest standard deviations (σ in W/m^2) for two- and three-filter fits for each solar irradiance component; the exception is that the first 15 entries in the direct 3-channel fits involve the open-channel plus two-filters.[1]

Total (3 λs)	σ	Total (2 λs)	σ	Direct (3 λs)	σ	Direct (2 λs)	σ	Diffuse (3 λs)	σ	Diffuse (2 λs)	σ
Open/673/940	2.22	**673/940**	2.45	Open/673/940	8.81	Open/615	9.08	**415/673/940**	1.02	**415/615**	1.04
415/673/940	2.37	Open/870	2.95	Open/615/940	8.99	Open/500	9.18	Open/415/615	1.03	415/673	1.06
615/673/940	2.41	Open/673	3.15	Open/500/870	9.02	Open/940	9.40	415/500/615	1.03	Open/415	1.29
500/673/940	2.42	615/940	3.56	Open/415/500	9.03	Open/415	9.43	415/615/673	1.03	Open/500	1.36
673/870/940	2.42	Open/615	3.70	Open/500/673	9.06	Open/870	9.48	Open/415/940	1.04	500/940	1.38
Open/870/940	2.43	Open/415	4.03	Open/415/615	9.08	Open/673	9.94	415/500/673	1.04	500/870	1.41
615/870/940	2.43	870/940	4.23	Open + 9 more two-filter combinations[1]	9.08…9.43	**500/870**	14.67	415/615/870	1.04	415/500	1.53
415/870/940	2.53	Open/940	4.27	**500/870/940**	10.41	673/940	15.42	415/615/940	1.04	500/615	1.55
Open/500/615	2.57	Open/500	4.29	615/870/940	11.08	415/870	16.61	415/673/870	1.04	500/673	1.55
500/870/940	2.61	500/940	5.32	673/870/940	12.64	615/870	18.38	Open/415/673	1.05	415/870	1.58

From: Michalsky et al. (2009) Solar Energy